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File: USPT

Oct 30, 2001

US-PAT-NO: 6309855

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TITLE: Family of mammalian potassium channels, their cloning and their use, especially for the screening of drugs

DATE-ISSUED: October 30, 2001

INVENTOR-INFORMATION:

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US-CL-CURRENT: 435/69.1, 435/320.1, 435/325, 514/44, 536/23.1, 536/22.4, 536/22.5, 536/24.1

CLAIMS:

What is claimed is:

1. An isolated and purified nucleic acid molecule coding for a protein capable of forming a potassium (K.sup.+) ion channel, comprising two P domains and three or four transmembrane segments.
2. The nucleic acid molecule of claim 1 coding for a protein wherein the number of P domains is two and the number of transmembrane segments is four.
3. The nucleic acid molecule of claim 1 which is human.
4. The nucleic acid molecule of claim 1 which is a cDNA copy of a 2.6 kilobase transcript expressed at high levels in the pancreas and placenta, and at lower levels in the brain, lung, prostate, heart, kidney, uterus small intestine and colon.
5. The nucleic acid sequence of claim 1 which codes for a protein which comprises the sequence represented by SEQ ID NO:4.
6. The isolated and purified nucleic acid sequence of claim 1 which codes for a protein which comprises the sequence represented by SEQ ID NO:4 or a sequence having the equivalent function of being capable of forming a potassium (K.sup.+) ion channel which comprises two P domains and four transmembrane segments.
7. An isolated and purified nucleic acid sequence of claim 2 which comprises an open reading frame (ORF) of 1185 nucleotides.
8. The isolated and purified nucleic acid sequence of claim 7 which is human.
9. A self replicating vector comprising the nucleic acid molecule of claim 1.
10. A cell transformed with the vector of claim 9, which cell is selected from the

group consisting of prokaryotes and eukaryotes.

11. The transformed cell of claim 10 which is a yeast, insect cell, plant cell or mammalian cell.
12. The transformed cell of claim 10 which is a bacterium.
13. A method for the expression and isolation of a potassium transport channel encoded by a nucleic acid molecule according to claim 1 in a competent host cell comprising transferring a self-replicating vector including said nucleic acid molecule into a competent host cell, culturing said host cell under conditions allowing the production of the potassium transport channel, and isolating and purifying the polypeptide comprising the potassium transport channel.